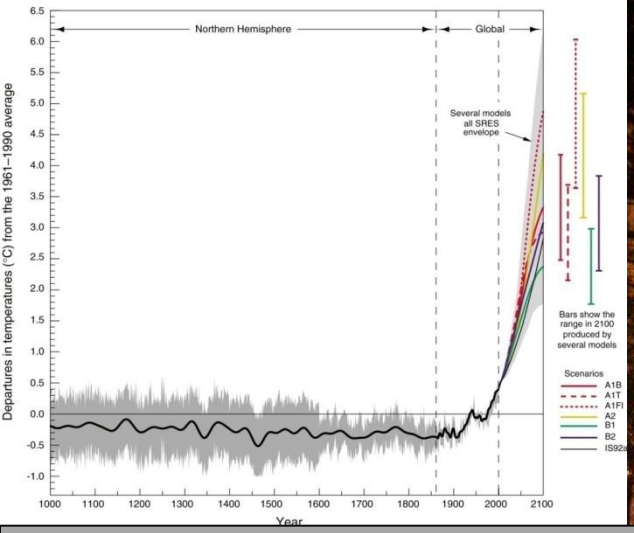
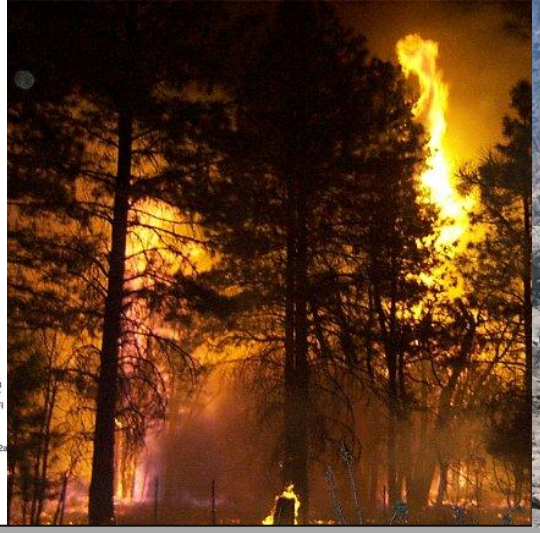




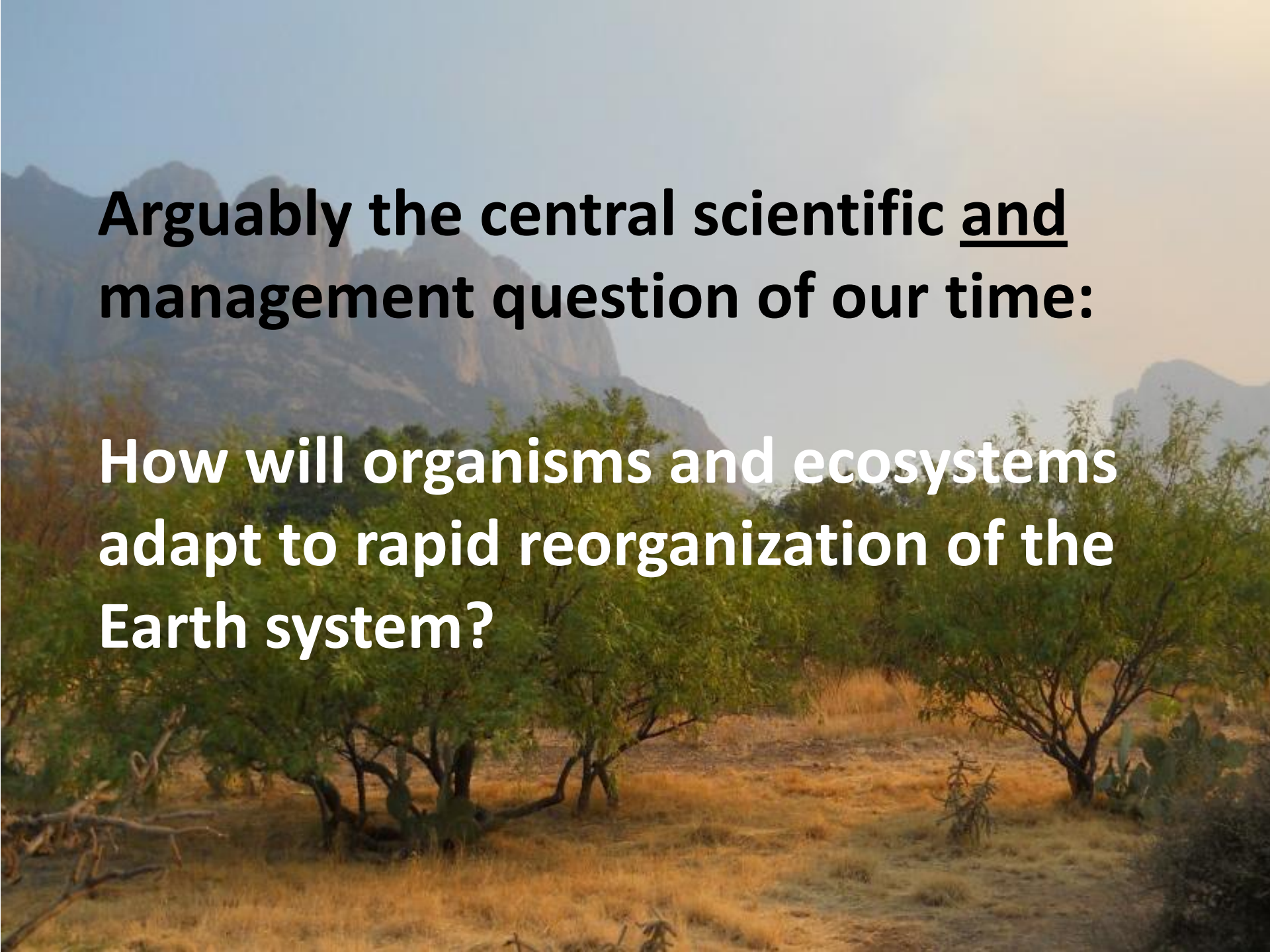

# Fire, Recovery and Resilience in Southwestern Ecosystems

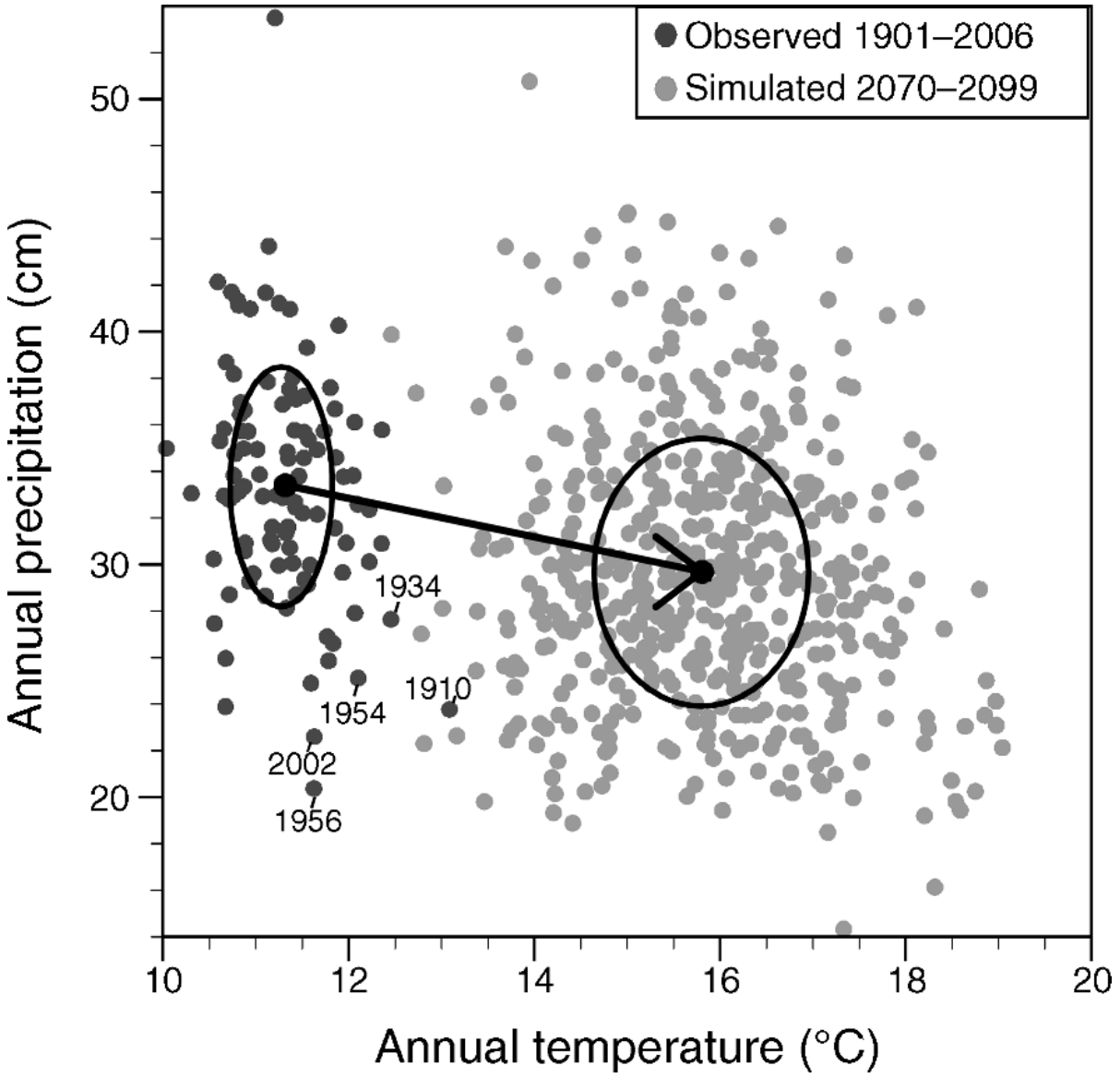
**Dr Donald Falk**

School of Natural Resources and the Environment

University of Arizona

**Research Insights in Semiarid Ecosystems(RISE), October 2012**


Arguably the central scientific and management question of our time:
How will organisms and ecosystems adapt to rapid reorganization of the Earth system?




Notaro et al. 2012, *Ecological Applications*

# Ecological change driven by climate alone operates on decadal time scales

- Poleward migration ~10 – 80 (160, Chen *et al.* 2011) km century$^{-1}$
- Upslope movement ~ 60 – 100 m century$^{-1}$

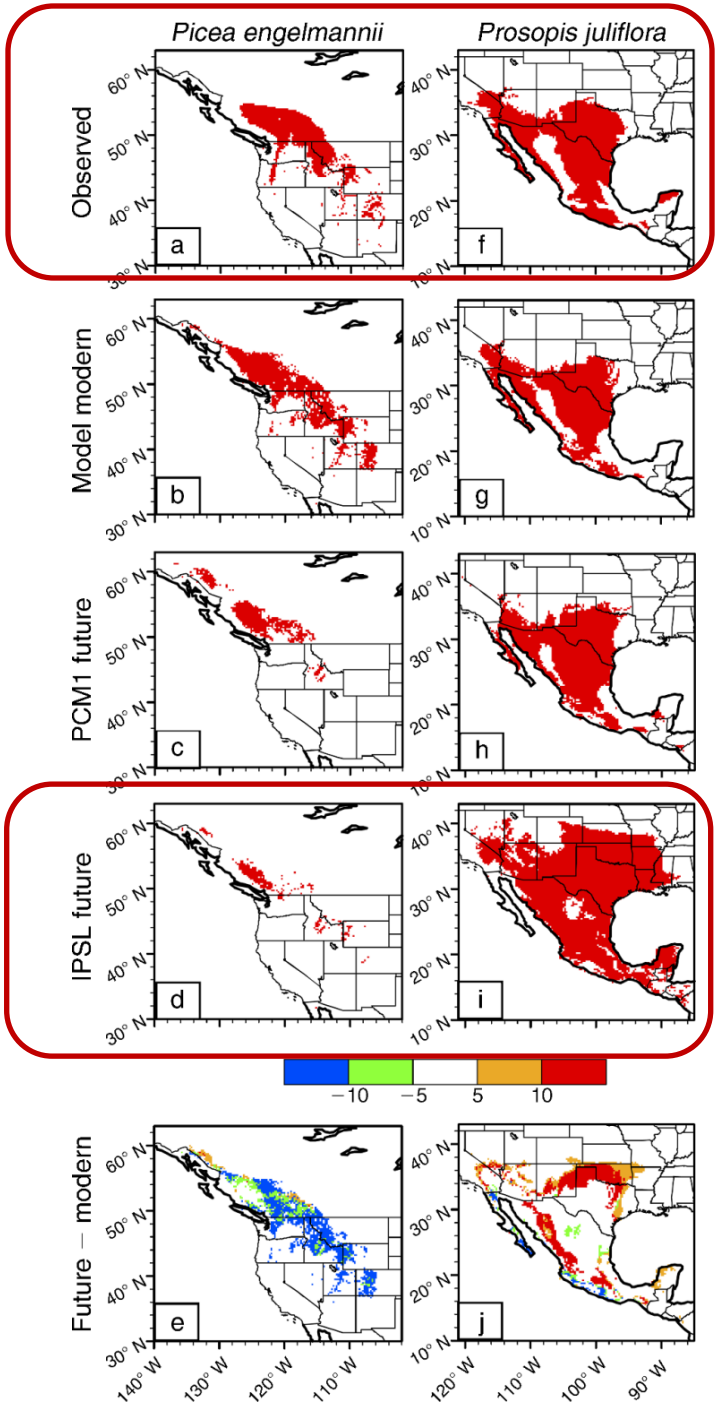


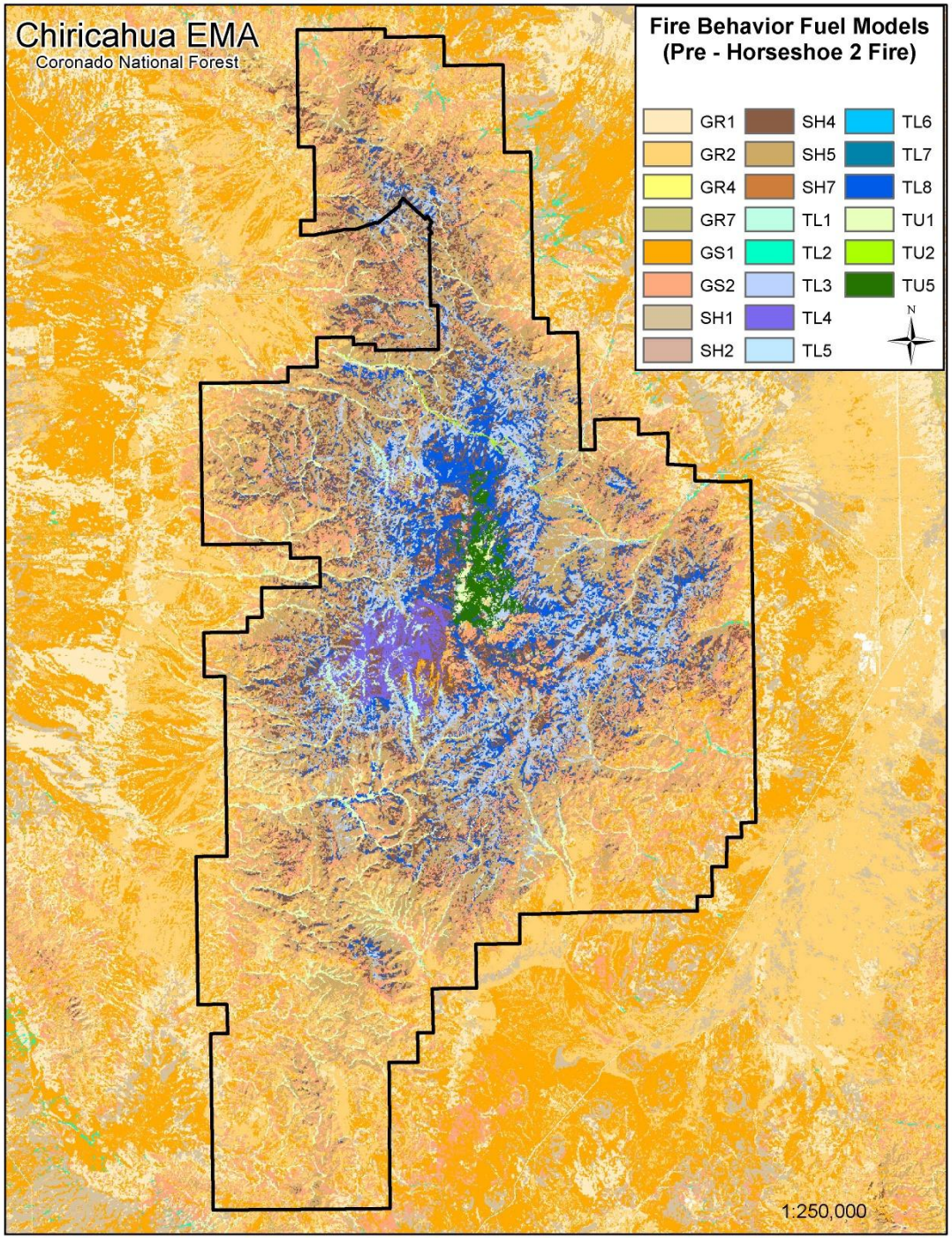

Figure: Notaro et al. 2012

# Fuels and climate change are driving unprecedented fire behavior and altered fire regimes.

2004 Nuttall-Gibson Complex, Pinaleño Mountains. Photo: Coronado NF

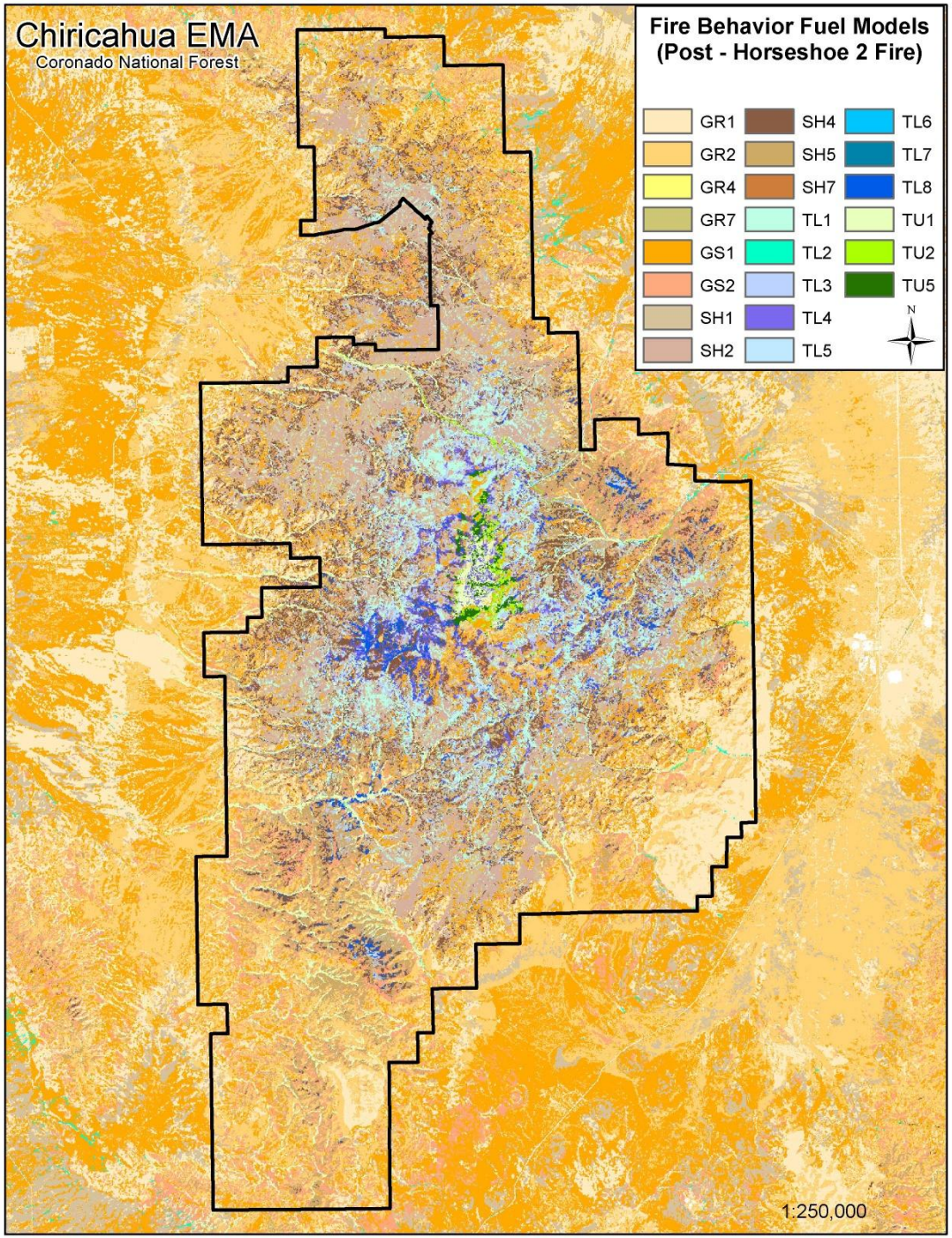
# Will interactions of fire and climate change push ecosystems past tipping points?

Post-Horseshoe 2 landscape,
Chiricahua Mts




# Pre-fire Fuel models, Chiricahua Mountains

Figures courtesy C. Stetson, Coronado NF and D. Helmbrecht, USFS TEAMS



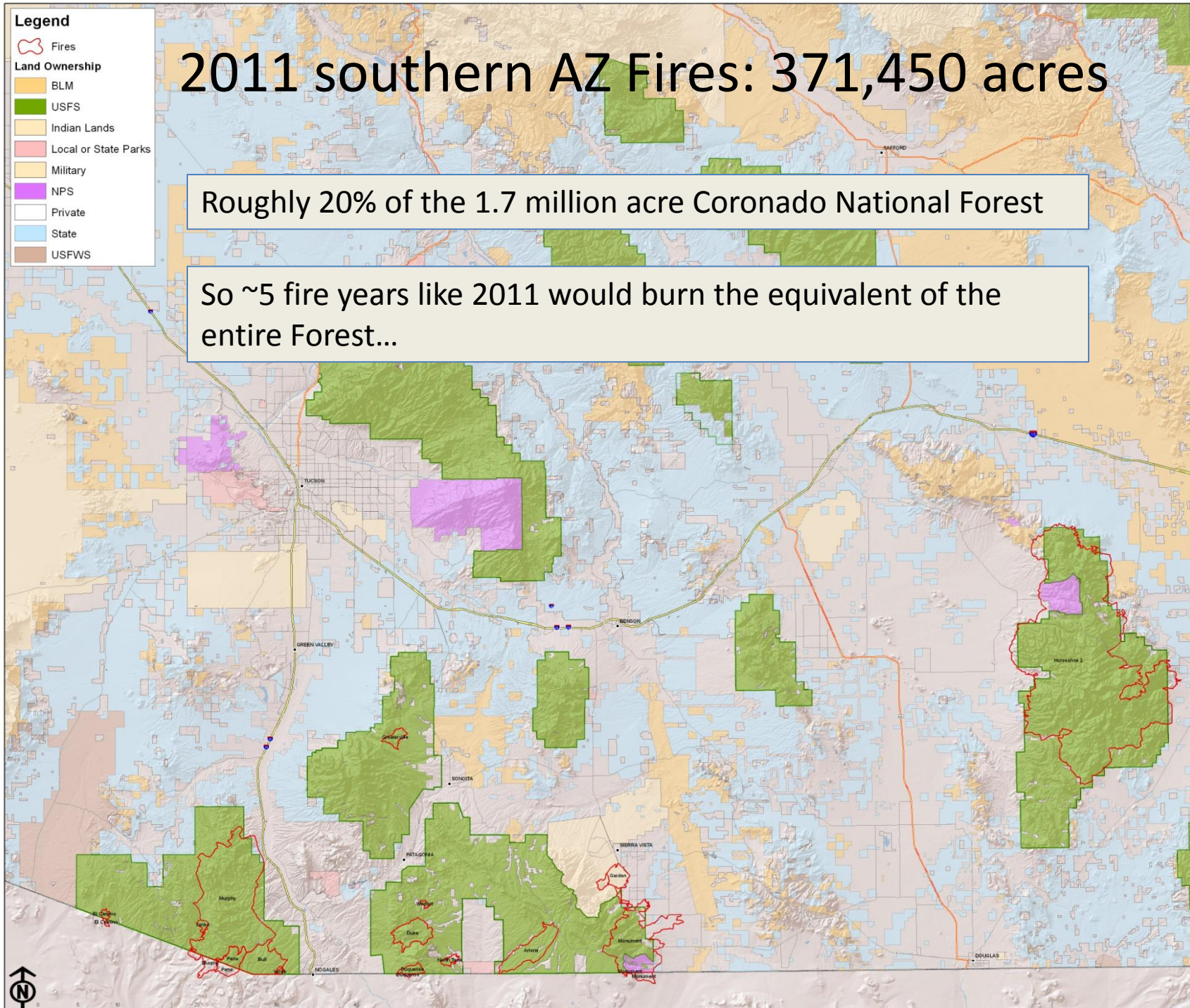

# Post-fire Fuel models, Chiricahua Mountains

Figures courtesy C. Stetson, Coronado NF and D. Helmbrecht, USFS TEAMS

# 2011 southern AZ Fires: 371,450 acres

| Name | Acres |
|---|---|
| Arlene | 10,599 |
| Bull | 9,702 |
| Copper Creek | 618 |
| Duke | 7,649 |
| Duquense | 1,750 |
| Duquense (MEX) | 242 |
| El Camino | 609 |
| El Camino (MEX) | 269 |
| Garden | 3,766 |
| Greaterville | 2,279 |
| Horseshoe 2 | 222,953 |
| Monument (MEX) | 1,659 |
| Monument | 30,393 |
| Murphy | 68,009 |
| Murphy (MEX) | 2,730 |
| North Tank | 1,143 |
| Pena | 3,523 |
| Pena (MEX) | 2,030 |
| Verde | 273 |
| Wildcat | 398 |
| Yanks | 856 |
| Total (w/MEX acres) | 371,450 |

Coronado NF Large Wildfires 2011




Roughly 20% of the 1.7 million acre Coronado National Forest

So ~5 fire years like 2011 would burn the equivalent of the entire Forest…


Near Rustler Park, 8200 feet, June 2010, inside 1996 Rattlesnake Fire


June 2012.


Horseshoe Canyon, 4800 feet, June 2010.


June 2012.

# Are we witnessing (and creating) a new paradigm?

Conservation biology

Restoration ecology

**Resilience ecology**

Home

- Goals
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- Management
- Participation
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# Goals

## Restore ecosystem processes and create resilient ecosystems

- Integrate the existing fire management program and FireScape
- Develop a basis for restoring sustainable, more natural fire regimes across large areas such as entire mountain ranges or large landscapes
- Improve management techniques and incorporate lessons learned from past and on-going work

## Apply innovative and scientific approaches

- Take advantage of mosaic patterns and reduced fuels left by past fires
- Use non-traditional tools and new technologies that have succeeded elsewhere
- Reduce undesirable effects of catastrophic wildfire on people and communities
- Conduct research and monitoring to answer key questions

## Keep people engaged in all activities

- Develop a shared vision by seeking out and working with partners and the public
- Share our experiences with others

FireScape
*E-mail us at:* azfirescape@cals.arizona.edu
*Mail us at:* 105 W. Stadium, Tucson, AZ 85721

# Thanks:

**Cori Dolan and Jim Malusa,** FireScape Project, School of Natural Resources and the Environment, University of Arizona

**Bill Edwards,** Gunnison National Forest

**Brooke Gebow,** The Nature Conservancy of Arizona

**Don Helmbrecht,** TEAMS Enterprise, US Forest Service

**Chris Stetson**, Coronado National Forest

**Jeremy Weiss**, Institute of the Environment, University of Arizona